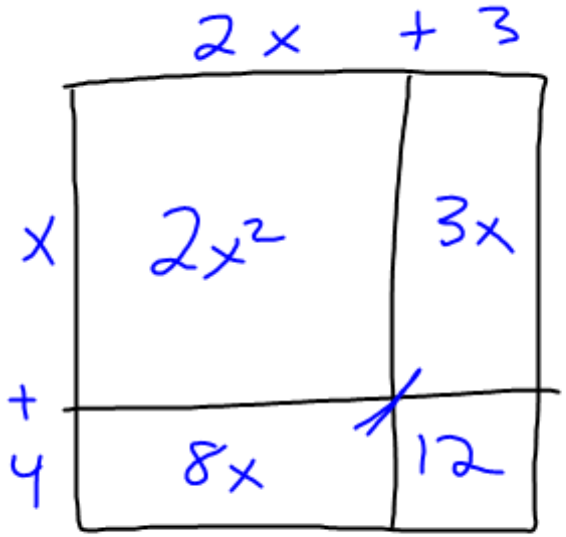
① Multiply $(2x+3)(x+4)$

② Factor $2x^2+14x+20$

③ Complete the square $2x^2+2x-6=0$

④ Find the minimum $2x^2-3x+4=0$

① Multiply $(2x+3)(x+4)$



$2x^2+3x+8x+12$

$$\boxed{2x^2+11x+12}$$

② Factor $2x^2 + 14x + 20$

$1 \cdot 2$

$1 \cdot 20$
$2 \cdot 10$
$4 \cdot 5$

$(2x + 4)(x + 5)$

OR

$(2x + 10)(x + 2)$

OR

$2(x+5)(x+2)$

③ Complete the square $2x^2 + 2x - 6 = 0$

① Divide everything by a

$$x^2 + x - 3 = 0$$

② Move c-term to other side

$$x^2 + x = 3$$

③ $\frac{1}{2}$ b, square it, add it to both sides $\frac{1}{2}(1) = \frac{1}{2}$, $\left(\frac{1}{2}\right)^2 = \frac{1}{4} = 0.25$ add it

$$x^2 + x + 0.25 = 3 + 0.25$$

④ Factor + simplify

$$(x + 0.5)^2 = 3.25$$

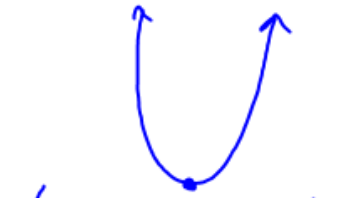
⑤ Move c-term back

$$(x + 0.5)^2 - 3.25 = 0$$

⑥ mult back by a

$$2(x + 0.5)^2 - 6.5 = 0$$

(4) Find the minimum (vertex) $2x^2 - 3x + 4 = 0$



$(0.75, 2.875)$

$\left(\frac{3}{4}, 2\frac{7}{8}\right)$

$x\text{-coord} = \frac{-b}{2a}$

$= \frac{-(-3)}{2(2)} = \frac{3}{4}$ or 0.75

y-coord → plug in ↗ to original equation

$y = 2(0.75)^2 - 3(0.75) + 4 = 2.875$

x-intercepts, roots, zeros

- $a(x-R_1)(x-R_2)$

  $R_1 + R_2$ are the x-int.

- $a(x-h)^2+k$

  Solve it when $y=0$

- ax^2+bx+c

  → Factor it

  → Quadratic formula

  → Complete the square

vertex

- $a(x-R_1)(x-R_2)$

  → avg. roots to find x-coord

  → plug x-coord into original eq.

- $a(x-h)^2+k$

  → (h, k)

- ax^2+bx+c

  → x-coord = $\frac{-b}{2a}$

  → y-coord = plug ↑ into original eq.

  OR

  → Complete the square